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IDEA-2758-65
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20 September 1965

MEMORANDUM FOR THE RECORD

SUBJECT: Meeting with Baird Atomic Representatives

At 1030 hours on 16 September 1965, a meeting was held to discuss the proposed new sextant and the drift sight intensifier for the U-2. The following personnel attended:

Materiel/OSA
Lockheed Aircraft Corp.
Baird Atomic
Baird Atomic
Baird Atomic
Baird Atomic
Plans/FA/OSA
Edwards AFB
IDEALIST/OSA
Materiel/OSA

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1. [] noted that the original sextant requirement stated that it would be a backup instrument only. It was to be simple, lightweight, and as mechanical as possible. This was taken to mean that there would be a minimum of electrical power needed. The requirement for the new sextant is minimum weight and size (less than 50 pounds and 25 pounds if possible), accuracy to two nautical miles and a guaranteed reliability factor.

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2. The new sextant is larger and it weighs considerably more than the old one. It is gyro-stabilized to provide a stable platform, and it has an image de-rotator. This last item is a major weight factor, but it keeps the image erect at all times. Although it still takes two minutes for preparation and shooting, only the last five seconds of this time requires the pilot's attention to the eyepiece.

3. This instrument requires a heading accuracy of 1/4 degree. It also requires a ground speed input with an accuracy of one percent. The objective of the new proposed sextant is to reduce the instrument error to two nautical miles.

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S E C R E T
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IDEA-2758-65

Page 2

4. Of several options presented, the best seems to be an automatic star tracker something like the one in the HOUND DOG missile. This is a more complex instrument of about the same size and weight, but it will cost more than the sextant. Even with this automatic unit, we should have a backup for manual sighting of celestial bodies. Another option was to add the gyro to the present sextant. In sum, this is not particularly feasible or economical.

5. With the new sextant, we would have to tie into the Doppler system to compensate the vertical reference for Coriolis and Rhumbline errors. We would also need to make corrections for wander in real time. This could be an extremely difficult job for a pilot because it takes considerable attention to detail and reference to charts to update wander corrections.

6. The best item presented, and the most advantageous overall, is the stable platform provided by the gyro. Baird will submit a new proposal using either the new optics or the present optics with the gyro but without the de-rotator prism.

7. The remainder of the meeting was a discussion of the drift sight intensifier tests. After the last test in which the intensifier tube lost pressure in flight and was damaged, it appears that we need some positive pressure source or warning in the system. There are three alternatives available:

- A. Encapsulate the intensifier tube under pressure.
- B. Provide a pressure switch to automatically shut off the system when the pressure falls below 12 pounds.
- C. A pressure bottle plumbed to the intensifier tube to maintain pressure.

Baird was instructed to evaluate the pressure switch as a first task, the inference here being that we should work for reliability rather than corrective measures. This could allow a given design to survive without basic correction.

8. Although the proposed sextant has several advantages over the old one, it was generally understood by OSA personnel that there is not enough improvement to warrant the increased cost (\$25,000 vs. \$10,000). It seems more practical to devote

IDEALIST
S E C R E T

S E C R E T
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IDEA-2758-65
Page 3

time, effort and money to the Doppler system which will provide more information and some form of automatic star tracker which requires far less work on the part of the pilot. The automatic star tracker also can be used to update the Doppler system. This would be particularly valuable on long over-water flights.

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Chief, Plans for Field Activities, OSA

Plans/FA/OSA (20 Sept 65)

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